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Technological advancement and accounting information relevance among small and medium enterprises in Nigeria

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Abstract: The study assessed the effect of technological advancement and accounting information relevance among Small and Medium Enterprises (SMEs) in Nigeria, specifically examining effect of cloud computing, blockchain technology, and artificial intelligence on the relevance of accounting information among SMEs in Nigeria. The study employed survey research design and used partial least squares structural equation modelling. The population comprised 7,889 registered SMEs in Ondo State, Nigeria, as recorded by SMEDAN in 2023. The sample size was 380 SMEs, determined using the Taro Yamane formula. This study revealed that blockchain technology enhances the relevance of accounting information, while artificial intelligence reduces it. Additionally, the results indicated that cloud computing has a significant positive impact on both blockchain technology and artificial intelligence. The study concludes that technological advancement, particularly cloud accounting, significantly impacts the relevance of accounting information. The study has practical implications for managers to integrate technological advancements into their financial operations to enhance efficiency and ensure the relevance of information for end users, meets stakeholders' needs and supports sound economic decision-making. Also, companies should adopt blockchain technology to improve the quality of financial reports, stabilize the company, and provide valuable information for economic decision-making.

Keywords: *Accounting information relevance, Artificial intelligence, Blockchain technology, Cloud computing, SMEs.*

1. Introduction

The relevance of accounting information dates back to ancient civilizations such as Mesopotamia, Egypt, and Rome, where basic record-keeping systems tracked economic transactions and managed resources [1]. The evolution of accounting practices parallels the growth of trade and capitalism, culminating in the double-entry system by Luca Pacioli in the 15th century, involving balancing debits and credits [2]. Technological advancements have significantly transformed accounting by enhancing decision-making, data accuracy, and process efficiency through digital tools and software [3]. Innovations such as cloud computing, artificial intelligence, and data analytics have improved financial reporting, risk management, and auditing procedures [4]. Blockchain technology and automated financial systems have also enhanced transaction security, traceability, and transparency [5]. Consequently, modern accounting now demands new skills in advanced technologies and data-driven insights [6].

The relevance of accounting information in Africa, including Nigeria, has not been immune to the disruptive effects of technological developments. Due to the exponential growth in internet connectivity and digital infrastructure, small companies and accounting firms throughout the continent are experiencing a paradigm shift [7]. Innovations such as accounting software, computerized tax filing systems, and online financial platforms have simplified financial management and compliance procedures [8]. The implementation of the Treasury Single Account (TSA) system in Nigeria, propelled by technological advancements, has enhanced fiscal control, reduced leakages, and increased

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accountability in government financial operations. Similarly, other African nations are adopting digital tools to improve financial transparency and efficiency. Moreover, the African accounting workforce faces a growing demand for upskilling and reskilling to navigate the digital landscape and harness the potential of technological tools [9, 10].

Recent studies on technological advancement across the globe highlight various aspects of the digital revolution and its significant effect on accounting practices [11-19]. However, only a few studies have focused on West African countries [18, 20]. The impact of blockchain on accounting has gained global interest, highlighting its potential to improve efficiency, transparency, and security [21]. However, there is a research gap concerning the potential drawbacks or limitations of blockchain adoption in accounting, such as increased cyber threats [22]. Most studies utilize systematic literature review methodologies, which may not fully capture practical implications [23].

Accounting plays a critical role in every organization without exception. The relevance of accounting information has evolved from transactional record-keepers to strategic collaborators in decision-making processes due to technological integration [24]. In an increasingly complicated and interconnected world, this transition is critical for businesses to remain active and make informed, data-driven decisions. This study seeks to delve into the numerous ramifications of technological breakthroughs on the relevance of accounting information by examining the challenges and opportunities presented by these advancements. By exploring global patterns and specific developments in Nigeria, this study aims to shed light on the transformative journey of the accounting field in the face of technological disruption. In the rapidly evolving business landscapes today, organizations across industries are embracing digital transformation to stay competitive and responsive to market demands.

2. Literature Review

2.1. Technological Advancement

Technological advancement refers to the process of introducing new or significantly improved technologies, products, or services that bring about positive changes, create value, and drive economic and social progress. It involves the application of new ideas, methods, processes, or tools to develop and implement novel solutions [25].

Accounting has begun to transition from traditional methods to digital advancements, demonstrating how technology-driven solutions can enhance quality and value in business operations, particularly across various processes. This technological shift is leading to changes in accounting business models [25]. Modern IT innovations are transforming the foundational aspects of managerial and accounting processes, redefining information sharing, aggregation, and distribution methods, and giving rise to a new accounting framework. Leveraging advancements in IT allows for the efficient processing of large amounts of information in minimal time. In addition to greatly speeding up the effective processing and thorough analysis of data, this use of cutting-edge cognitive technologies has also successfully ensured the integration and adoption of current global and European trends pertaining to improving transparency in the areas of control, accounting, and reporting. Blockchain technology satisfies these technological demands for high levels of information safety, quality, and transparency [26]. Professional accountants may concentrate on more creative work because digitalisation reduces the amount of manual labour they must perform. This helps management in its attempts to increase competitiveness and provide value to the company [27].

2.1.1. Blockchain

Right now, one of the most important and well-liked technologies is blockchain. This technology serves as the fundamental framework for how cryptocurrencies operate. A blockchain is made up of a series of documents called blocks, each of which is organized in a particular order. There is a set number of transactions in each block, and each transaction is kept as the result of a hash function. Every time a block is created, an authentic address known as a hash is rebuilt, and any modifications made to the block also affect the hash value. All nodes in the network that are involved in the functioning of digital

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currency must agree before any action or decision can be taken. Cryptographic functions and the data are processed using algorithms and protect user privacy and data integrity. The best protection is provided by robust and sophisticated encryption techniques.

There is no single central body in charge of administration; instead, the entire block and information system is handled decentralized. Unlike other payment systems, this one is under the authority of the government or any other central body. Blockchain is still in its infancy and is developing in response to demand from around the world. In order to guarantee dependability, it also needs an extra internet component for data security [28].

Blockchain, according to Bogdanović et al. [29] is a distributed database composed of linked, smaller databases called blocks. Timestamps, unique hash values, and transaction data are all contained in these blocks. Because of the way the blocks are connected, it is impossible to make changes to transactions in the past [30]. Because these links are created using cryptography, it is simple to identify and stop retroactive changes by looking at the hash values of each block, which include the hashing value of the previous row. Blockchain has an extremely secure design because of these features [31]. (Figure 1).

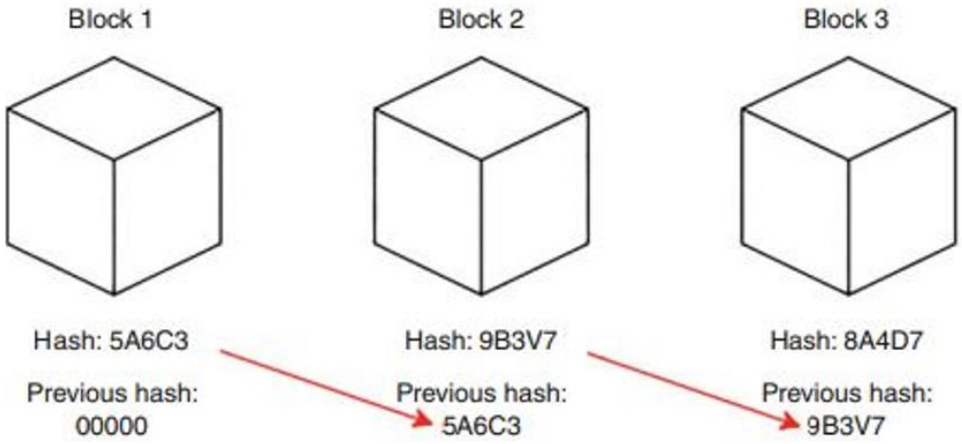

Figure 1.
The structure of blockchain.

Integrating blockchain technology into accounting information systems offers several potential advantages, including increased transparency, enhanced security, and more efficient streamlined processes. However, there are also challenges and possible drawbacks related to its implementation. With the use of pertinent citations, this study will investigate the drawbacks and difficulties of putting blockchain technology into practice in the context of accounting information relevancy.

A major obstacle to blockchain adoption in accounting is the necessity to make substantial adjustments to current systems and procedures. Every transaction in the blockchain is recorded and verified by several parties on a distributed, decentralized ledger. This necessitates a major change in the verification, audit, and storage of accounting data. This transformation process can be difficult and time-consuming, especially for large organizations with legacy systems, according to a KPMG study [32].

Another challenge is the cost involved in implementing blockchain technology. Although blockchain can reduce costs in the long run by eliminating intermediaries and improving efficiency, the initial investment required can be substantial. Companies that want to incorporate blockchain technology into their accounting systems need to make investments in software development, infrastructure, and training. Additionally, continuous maintenance and updates are required to ensure the smooth functioning of the blockchain network [33].

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Furthermore, one of the main issues with blockchain technology is scalability. The performance of a blockchain network may deteriorate as more transactions and users sign up for it. Blockchain networks, particularly public blockchains, struggle with handling high transaction volumes while maintaining speed and efficiency. This limitation can be a significant deterrent for large organizations with a high volume of financial transactions [33].

Data privacy and confidentiality pose another challenge in implementing blockchain in accounting. A transaction recorded on a blockchain ledger is visible and unchangeable, meaning it cannot be removed or altered. While increasing transparency, this feature might not comply with laws pertaining to privacy, including the General Data Protection Regulation (GDPR). GDPR requires businesses to guarantee the right to be forgotten, which is incompatible with the blockchain principle of immutability.

Additionally, the complexity of blockchain technology and the absence of standardized frameworks and regulations pose challenges for auditors. Auditing transactions on blockchain requires an in-depth knowledge of the associated risks and technologies. Auditors must evaluate the reliability and accuracy of smart contracts, verify the identity and integrity of participants, and ensure compliance with relevant accounting standards. The lack of clear guidelines and standards for auditing blockchain transactions further adds to the complexity [34].

2.1.2. Artificial Intelligence

The ability of a device or computer network to simulate and perform tasks. They often require human intelligence. Artificial intelligence (AI) is the ability to perform tasks like learning, problem-solving, and logical reasoning. The basis of synthetic intelligence is the application of methods and technology for machine learning to provide computers with the ability to exhibit specific cognitive abilities and perform tasks independently or partially autonomously. The degree of cognitive ability or the level of autonomy that artificial intelligence possesses serves as a defining characteristic. Its capacity can be weak or constrained, widespread or exceptional. Because of its autonomy, it can be entirely autonomous, reactive, deliberative, or cognitive. As artificial intelligence continues to develop, tasks that currently seem challenging will be completed more efficiently, making many procedures more efficient [35].

Blockchain, cloud computing, and the Internet of Things are regarded as some of the other major technologies of the future, along with artificial intelligence (AI). It is described as a machine's capacity to mimic human abilities, including communication and decision-making. Numerous fields have already seen the advantages of utilizing artificial intelligence technologies, such as the possibility for more accurate results and time savings while processing massive volumes of data. Artificial intelligence solutions are an interesting issue for research, especially when considering their implications on the accounting sector, even though they are neither a new topic for researchers nor a regular practice for technologically savvy firms [36].

Artificial Intelligence technology is already being used by accountants in their daily work to increase efficiency and reduce time. Although implementing AI technology in this scenario would not be a game-changer for their careers, there are a number of benefits. These include the capacity to use data-driven decision-making to accomplish goals and save a substantial amount of time that would otherwise be spent on repeated operations.

2.1.3. Cloud Computing

On-demand delivery of services is referred to as cloud computing, which involves internet access to shared pools of configurable computer assets such as networks, computers, memory, software, and programs that may be quickly provided and released with no administrative effort or participation from service providers. Cloud computing has become a significant technological trend, with some experts predicting that it will transform IT procedures and the IT industry [37].

Through the application of the Internet, cloud computing technology transfers processing and storage duties from local computers to distant servers referred to as the "cloud." Information technology programs become on-demand services instead of tangible goods as a result of this change.

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The architecture of cloud computing is based on state-of-the-art data centres that provide large amounts of storage and a range of services, including software (SaaS). SaaS eliminates the requirement for local installation and maintenance by giving consumers access to software programs via the Internet.

A model for enabling permanent and convenient Cloud computing, according to the National Institute of Standards and Technology (NIST), is the network on-demand access and sharing of a collection of computer resources and services that may be swiftly deployed and supplied with minimal effort by the administration or interaction with the service provider [38].

Khanom [39] highlighted several advantages of cloud accounting, such as cost savings, real-time data access, accessibility from anywhere, improved security compared to traditional desktop software, and automatic data backups. However, these benefits come with risks like potential data breaches, network downtime, and user or developer errors. Due to these concerns, many accountants remain cautious about fully embracing cloud accounting, despite its promising advantages.

2.2. Accounting Information Relevance

Accounting, often referred to as the language of business, is fundamental for documenting, categorizing, and compiling financial transactions. It plays a crucial role in conveying financial information about economic institutions. This discipline has evolved significantly with the advent of information technology, enhancing the efficiency and accuracy of accounting processes. Similar to a conveyor belt, accounting propels a business forward by providing key stakeholders with crucial financial accounts, including the profit and loss account and balance sheet. According to Khan et al. [40], advancements in technology have made accounting terminology more accessible, allowing accountants to perform their tasks more efficiently. By the late 20th century, the relevance of accounting information had transformed considerably, adapting to new technological landscapes.

Emerging technologies are transforming the daily tasks of accountants and affecting the professional lives of millions globally. This transformation is driven by rapid technological advancements, increased globalization, and changes in legislation and regulation. Prior to 2010, information and communication technologies were paramount, continuously improving connectivity and knowledge sharing. Olivier [41] explores the concept of open advancement, which emphasizes the importance of integrating external knowledge to foster organizational growth. As technological advancements come with their own challenges, open advancement becomes crucial in addressing these issues effectively [42]. Embracing open advancement allows organizations to harness the collective intelligence and innovations of the broader community, enhancing their ability to navigate the complexities of modern technology [43].

Accountants have traditionally been quick to adopt new technologies, yet the entire capacity of accounting technologies is only possible through a fundamental shift in accounting practices. Emerging technologies promise to revolutionize the work of accountants and researchers, but this requires the concurrent development of new paradigms to understand and utilize new data effectively [44]. Professional accounting organizations have developed competency frameworks and reports to prepare for future changes in the profession. These frameworks aim to equip accountants with the necessary skills to leverage new technologies and address emerging challenges [45]. As technological advancements continue to reshape the accounting field, it is crucial for accountants to evolve and adapt to stay relevant and to take advantage of new opportunities [46].

The future of accounting depends on how well professionals adapt to new technologies and acquire the necessary skills. The 2018 AACSB, or Association to Advance Collegiate Schools of Business, highlights the importance of integrating information technology in accounting education, stressing that both faculty and students must master emerging technologies [47]. Despite recent studies linking emerging technologies to accounting relevance, more research is required to fully comprehend the effects of digitalization [48]. The literature suggests that technologies such as blockchain are transforming accounting practices by offering new methods to enhance transparency and efficiency in

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financial reporting [49]. As the accounting profession evolves, continuous learning and adaptation will be essential for maintaining relevance in a rapidly changing technological landscape.

2.3. Theoretical Review

The theoretical framework for this research is the Theory of Diffusion of Innovation [50]. Rogers proposed this theory to explore how innovations are accepted and adopted by individuals and organizations. Rogers established the 'Diffusion of Innovation' theory by synthesizing findings from over 508 diffusion studies. This theory defines "the process by which an innovation is communicated through certain channels over time among the members of a social system" [50]. This theory basically explains the process of diffusion the gradual spread of innovations within a social system over time. The five stages of innovation adoption include comprehension, persuasion, choice, execution, and confirmation according to Rogers [50]. This development is represented by the S-shaped adoption curve, which divides adopters into innovators, early adopters, early majority, late majority, and laggards.

Rogers developed the 'Diffusion of Innovation' theory by combining findings from more than 508 diffusion studies. This theory defines "the process by which an innovation is communicated through certain channels over time among members of a social system" [50]. This theory outlines how innovations spread through a social system over time, a process known as diffusion. Rogers [50] identified that there are five phases in the adoption of the innovation process: understanding, convincing, selecting, executing, and verifying. This pattern is represented by the S-shaped adoption curve, where adopters are categorized as laggards, innovators, early adopters, early majority, and late majority. This model is particularly useful for evaluating the actual usage of technology, especially in testing new technologies, and is effective for assessing applications available on platforms such as the Google Play Store or Apple App Store (iTunes).

Additionally, the Technology Acceptance Model (TAM), which was developed from Ajzen and Fishbein [51], the Theory of Reasoned Action (TRA) provide further insights. TRA posits that attitudes towards behavior are shaped by beliefs about the outcomes of the behavior and the evaluation of those outcomes. Davis [52] introduced TAM to address how users come to accept and use technology. TAM asserts that perceived usefulness and perceived ease of use are key determinants of user acceptance. According to TAM, a user's behavioral intentions, influenced by their attitudes towards the technology, ultimately determine technology acceptance. Davis [52] argued that favorable attitudes and intentions towards technology are driven by beliefs in its usefulness and ease of use.

2.4. Empirical Review

2.4.1. Cloud Computing on Accounting Information Relevance

Ojukwu [53] investigated the impact of disruptive technologies on the teaching of accounting in Nigeria, focusing on the viewpoints of accounting students and lecturers. The study concentrated on challenges such as insufficient budget, ongoing academic closures owing to staff union industrial strikes, and lockdowns induced by pandemics like COVID-19. It used Expansive Learning Theory as a theoretical framework and employed a quasi-experimental study design. Data were collected via an online survey questionnaire that was circulated and processed in April 2022. The data were analyzed via descriptive statistics. The findings indicate that accounting students and lecturers are pleased with the use of electronic learning in accounting education and training. The study also discovered that employing eLearning will improve the quality of accounting education while reducing teaching and learning losses during industrial actions and shutdowns. The study discovered that e-learning has a positive impact on accounting education at Nigerian federal universities.

Nwokike [54] conducted a study on technological advancement among accounting graduates in Nigeria. The research design used in the study was descriptive. Eighty accounting educators from public tertiary universities and sixty-nine senior accountants from government ministries in Enugu State, Nigeria, comprised the population of 149 respondents. The study did not draw a sample; instead,

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the full population was used. The study was led by two hypotheses and two research questions. A structured questionnaire that the researcher created was the tool utilized to collect data. Three professionals validated the instrument. To acquire the data, a 32-item questionnaire was employed. The study's conclusions showed that accounting graduates needed both soft skills, like the capacity to evaluate and comprehend financial data and engage with a varied range of people, and technology skills, like computer operations, word processing, and spreadsheet software.

Yaser and Manaf [55] investigated how Iraq's accounting system was affected by the development of information technology. About how information technology affects how applicable accounting information is, the study examined a range of sources and relevant literature. Determining the primary consequences, enhancing the advancement of these technologies to fortify the AIS, and minimizing faults were the objectives. The study concluded that advances in information technology have aided in the creation of corporate accounting systems and enhanced business performance.

2.4.2. Blockchain Technology on accounting information relevance

Savic et al. [56] explored the impact of digitalization on the relevance of accounting information in the Republic of Serbia, with a focus on innovative methods for communicating accounting information both internally and externally. The study emphasizes changes in financial reporting processes, current regulations, and advancements in management accounting driven by digitalization.

Helsinki et al. [57] examined the influence of digital accounting on the human factor in Brazil, particularly focusing on company managers and analyzing both institutional and external documents related to national and international accounting developments. The research identified blockchain-based distributed ledgers as a significant technological advancement shaping the industry and altering future job roles.

Jodie [58] evaluated how internet-related technologies are changing the way accountants in the UK execute their jobs. With a focus on qualitative research methodology and semi-structured interviews, the study included three case studies. The results showed that the impact of new technologies on accountants' daily tasks has not been sufficiently discussed by academics.

Marrone and Hazelton [44] looked into how new technologies could affect accounting, accountants, and accountability in Australia in a disruptive and transformative way. Through a comparison of accounting research publications that featured the phrase "disrupt" with those that included the word "technology," the study discovered that there was a minimal correlation between academic articles that featured the idea of "disruption" and technology.

Gulin [59] reviewed professional and academic literature to analyze the challenges digitalization poses to the relevance of accounting information in the UK. Their findings highlighted critical issues such as the influence of big data on accounting and reporting, the role of cloud computing in continuous accounting, and the consequences of blockchain technology and artificial intelligence.

2.4.3. Artificial Intelligence on Accounting Information Relevance

Thottoli [60] aimed to identify popular hashtags in the subject of accounting in Oman, including artificial intelligence (AI), blockchain, big data, cloud, enterprise resource planning (ERP), and information and communication technology (ICT). By conducting a bibliometric analysis using the Scopus database, the study examined research trends from 1984 to 2021. The analysis revealed that research focused on these technology hashtags began to gain traction after 2010, with few references or publications before that time.

Gonçalve's [13] qualitative and exploratory study, which included three case studies and semi-structured interviews, investigated the impact of digital transformation on the future of accounting practices in Portugal. According to the study, while small and medium-sized accounting firms are still in the early stages of digital transformation, technologies such as Industry 4.0, optical character recognition (OCR), artificial intelligence (AI), robotics, and cloud-based ERP systems are beginning to have a more significant impact.

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Derya et al. [61] investigated the impact of machine learning applications on accounting and auditing in Turkey. By analyzing machine learning tools and platforms developed by Big Four accounting firms, the study found that these firms have introduced tools for tasks such as audit coordination, fully automated audits (e.g., cash audits), data analysis, risk assessment, and information extraction from documents. Also, Stancheva-Todorov and Palšienė [62] investigated how artificial intelligence affects Kenya's need for accounting data. Survey data revealed that while AI has advanced accounting practices, it has also introduced challenges that impact the relevance of accounting information.

3. Methodology

The study employed a survey research design. A survey research design is considered most appropriate for this because of its effectiveness in collecting opinions, perspectives, views, attitudes, and descriptions from respondents who are directly involved in the topic of the study, as well as examining cause-and-effect relationships. The survey design involved the use of a questionnaire for primary data collection. The self-developed structured questionnaire was used to elicit information from the respondents. The data gathered was analyzed using descriptive and inferential statistics for easy presentation and interpretation.

The population of this study comprised the registered SMEs in 18 local government areas of Ondo State, Nigeria. According to the Small and Medium Enterprise Development Agency of Nigeria (SMEDAN) survey report on MSMEs, there were 7,899 registered SMEs in Ondo State as of 2022 [63].

3.1. Model Specification Variables

The model employed for this study was adopted from the research work of Akinkunmi [64] and modified to suit the objectives of the study.

$$CCC = \beta 0 + \beta 1 * TECH\_INNOV + \varepsilon \quad (1)$$

$$BCK = \beta 0 + \beta 1 * TECH\_INNOV + \varepsilon \quad (2)$$

$$AI = \beta 0 + \beta 1 * TECH\_INNOV + \varepsilon \quad (3)$$

Where:
TECH_INNOV = Technological Advancement, CCC = Cloud Computing, BCK = Blockchain Technology, AI = Artificial Intelligence, $\beta 0$ = Constant, $\beta 1$ = Regression coefficient, ε = Error term.

4. Results and Discussions

4.1. Descriptive Statistics

Table 1 provides insights into Nigerian firms' opinions on cloud computing, blockchain technology, artificial intelligence, and the relevance of accounting information. For cloud computing (CCC), the average response from Nigerian firms is 4.063, indicating general agreement with the questions posed. However, there is notable variation in responses, as evidenced by a standard deviation of 0.417. The data shows a negative skew with a skewness of -0.84 and a high kurtosis value of 8.43, suggesting an abnormal distribution with responses clustering towards the higher end of the scale. Regarding blockchain technology (BCK), the average response is 4.103, reflecting strong agreement among respondents. The standard deviation of 0.431 indicates considerable variability in their views. The data exhibits a positive skewness of 0.132 and a kurtosis of 0.722, indicating an abnormal distribution where responses are more concentrated towards the lower end of the scale.

For artificial intelligence (AI), the average response is 4.093, signifying a high level of agreement. The standard deviation is 0.419, showing significant variability in responses. The skewness is -0.076, and the kurtosis is 0.657, indicating a negatively skewed and abnormal distribution, with responses tending to cluster towards the higher end. Lastly, the average response concerning the relevance of

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accounting information (ACR) is 3.960, suggesting substantial agreement. The standard deviation of 0.638 points to considerable variation in responses. The data is negatively skewed with a skewness of -0.076 and a kurtosis of 0.657, reflecting an abnormal distribution with responses predominantly at the higher end.

These descriptive statistics provide a detailed view of how Nigerian firms perceive the impact of these technological advancements on the relevance of accounting information.

Table 1.
Descriptive Statistics of Leadership Competence Variables.

Variables	Obs.	Mean	Std. Dev.	Min.	Max.	Skewness	Kurtosis
CCC	380	4.063	0.417	1	5	- 0.84	8.43
BCK	380	4.103	0.431	1	5	0.132	0.722
AI	380	4.093	0.419	1	5	-0.076	0.657
ACR	380	3.960	0.638	1	5	-0.076	0.657

4.1.1. Test of Hypothesis

The research employs partial least squares structural equation modeling (PLS-SEM) to evaluate hypotheses and achieve the study's specific objectives. This method is selected for its appropriateness in managing small sample sizes and data that may not adhere to a normal distribution, characteristics frequently observed in survey data. To assess the significance of the PLS-SEM results, a bootstrapping procedure is utilized. This process involves analyzing all constructs related to the endogenous variable against each exogenous variable, with path coefficients reported to evaluate the strength and direction of the relationships.

4.2. Technological Advancement and Accounting Information Relevance

To test the hypotheses proposed in the study, the relationship between technological advancement and accounting information relevance was examined using Spearman's rank correlation. This non-parametric test is suitable for hypothesis testing in survey research. Using Spearman's rank correlation will aid the study in assessing how cloud computing, blockchain technology, and artificial intelligence influence the relevance of accounting information in Nigerian firms. This analysis will clarify the impact of these technologies on accounting practices.

The correlation results, as shown in Table 2, reveal a positive and significant relationship between cloud computing and accounting information relevance. Specifically, the relationship is significant in that a one-unit improvement in cloud computing will lead to a 27.39 percent improvement in the relevance of accounting information. This is evidenced by a correlation coefficient of 0.2739 and a p-value of 0.000.

The correlation results reveal that blockchain technology (BCK) positively impacts the relevance of accounting information, with a one-time improvement in BCK enhancing relevance by 30.84%, as indicated by a coefficient of 0.3084 and a p-value of 0.000. Conversely, artificial intelligence (AI) negatively affects the relevance of accounting information, with a one-time improvement in AI reducing relevance by 25.01%, reflected by a coefficient of -0.2501 and a p-value of 0.000.

Additionally, the results show a positive relationship between accounting information relevance (AIR) and cloud computing, with a one-time improvement in AIR increasing cloud computing relevance by 27.39%, evidenced by a coefficient of 0.2739 and a p-value of 0.000. Blockchain technology (BCT) also positively influences cloud computing, where a one-time improvement in BCT boosts cloud computing relevance by 66.20%, with a coefficient of 0.6620 and a p-value of 0.000. Moreover, AI has a positive effect on cloud computing, with a one-time improvement in AI enhancing cloud computing relevance by 57.92%, as shown by a coefficient of 0.5792 and a p-value of 0.000.

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Table 2.
Correlation Matrix.

Variables	Spearman's rho	Accounting Information Relevance	Cloud Computing	Blockchain Technology	Artificial Intelligence
Accounting Information Relevance	Coefficient	1	0.2739*	0.3084*	-0.2501*
	Sig. (2-tailed)	-	0.000	0.000	0.000
	N	380	380	3.8	3.8
Cloud Computing	Coefficient	0.2739*	1	0.6620*	0.5792
	Sig. (2-tailed)	0.000	-	0	0
	N	3.8	438	380	380
Blockchain Technology	Coefficient	0.3084*	0.6620*	1	0.6374
	Sig. (2-tailed)	0.000	0.000	-	0.000
	N	380	380	438	380
Artificial Intelligence	Coefficient	-0.2501*	0.5792	0.6374	1
	Sig. (2-tailed)	0.000	0.000	0.000	-
	N	380	380	380	438

The first specific objective of the study was to determine whether technological advancements impact the relevance of accounting information in Nigerian firms. To address this, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed. The assessment of the structural model involved examining the path coefficient, t-statistic value, probability value, R-squared values, effect size (f^2), predictive relevance, and model fit index, as illustrated in Figures 2 and detailed in subsequent tables.

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Table 3.
Construct Reliability and Validity.

Variables	Indicators	Factor Loadings	Cronbach Alpha	Composite Reliability	Average Variance Extracted	No of Items
Accounting Information Relevance	ACR1	0.743	0.599	0.754	0.519	5
	ACR2	0.744				
	ACR3	0.724				
	ACR4	0.584				
	ACR5	0.483				
	ACR6	0.718				
	ACR7	0.593				
	ACR8	0.649				
Artificial Intelligence	AI1	0.227	0.791	0.836	0.508	3
	AI10	0.184				
	AI2	0.657				
	AI3	0.691				
	AI4	-0.144				
	AI5	0.617				
	AI6	0.075				
	AI7	0.142				
	AI8	0.545				
Blockchain Technology	BKC1	0.282	0.748	0.841	0.572	4
	BKC2	0.817				
	BKC3	-0.028				
	BKC4	0.138				
	BKC5	0.700				
	BKC6	0.704				
	BKC7	0.080				
	BKC8	0.734				
	BKC9	0.344				
Cloud Computing	CCP1	0.432	0.510	0.798	0.665	2
	CCP10	0.482				
	CCP2	0.495				
	CCP3	0.042				
	CCP4	0.683				
	CCP5	0.211				
	CCP6	0.535				
	CCP7	0.346				
	CCP8	0.045				
	CCP9	0.708				

Table 3 outlines the quality of measurements and items used in the analysis. Several questionnaire items did not meet the 0.6 threshold for outer loadings and were therefore excluded. For Cloud Computing (CCC), items 1, 2, 3, 5, 6, 7, and 8 were removed due to insufficient factor loadings. Similarly, for Blockchain Technology (BCK), items 1, 3, 4, 7, and 9 were excluded. In the case of Artificial Intelligence (AI), items 1, 4, 6, 7, 8, 9, and 10 were removed. Accounting Information Relevance (ACR) also had items 4, 5, and 7 excluded for failing to meet the threshold.

The remaining items were assessed for internal consistency. While Cronbach's Alpha is commonly used in social sciences, composite reliability is preferred for PLS analysis. All variables met the required threshold of composite reliability above 0.7. Convergent validity was evaluated using the Average Variance Extracted (AVE), with values indicating that the convergent validity of the variables was accepted, as the AVE values met the threshold suggested by Bangazzi and Yi [65].

Table 4 presents the results for discriminant validity, determined using the Fornell-Larcker Criterion. This method calculates the square root of AVE for each latent variable, ensuring that measures of different traits are not overly related and helping to prevent multicollinearity. The results show that the discriminant validity values are as follows: Artificial Intelligence (AI) has a value of 0.721,

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exceeding the correlations between AI and accounting information relevance, blockchain technology, and cloud computing. Accounting Information Relevance (ACR) has a value of 0.713, surpassing correlations with blockchain technology and cloud computing. Blockchain technology (BCK) shows a value of 0.756, higher than the correlation with cloud computing. Finally, Cloud Computing (CCC) has a value of 0.816, which is the highest among the variables.

Table 4.
Discriminant Validity.

Variables	Artificial Intelligence	Accounting Information Relevance	Blockchain Technology	Cloud Computing
Artificial Intelligence	0.721			
Accounting Information Relevance	0.321	0.713		
Blockchain Technology	0.566	0.373	0.756	
Cloud Computing	0.577	0.416	0.708	0.816

The overall findings, as illustrated in Figure 2 and Table 5, respectively, indicate that financial reporting quality has 67.2 percent variance explained by leadership competence attributes, and this can be considered as high variance. The model is deemed a good fit, as the standardized root mean square residual (SRMR) is below 0.1, and the normed fit index (NFI) is close to 1 [66, 67]. The contribution of each attribute to the R-squared value was assessed by the effect size (F-Square), and it was observed that artificial intelligence (AI) had the weakest magnitude, with a value of 0.006, which is below the 0.1 threshold recommended by Cohen [68]. This implies that if other exogenous variables are held constant while artificial intelligence is removed, the R-squared value will vary by 0.6 percent. It is, however, observed that if other exogenous variables are held constant while blockchain is removed, it will cause R-squared to vary by 1.0 percent, indicating a low magnitude of influence. Similarly, cloud computing has an effect size of 0.41 percent, meaning its removal would result in a 0.41 percent variation in the R-squared value when other variables are held constant.

The model's predictive relevance for each exogenous variable, as indicated by Q^2 values, shows that it effectively predicts outcomes, given that all values are greater than 0. Specifically, a one-unit improvement in artificial intelligence (AI) results in a 19% increase in accounting information relevance (ACR). Similarly, a one-unit enhancement in blockchain technology (BCK) leads to a 4.2% increase in ACR, demonstrating its substantive impact.

Table 5 and Figure 2 reveal that all constructs have a p-value of ≤0.05, indicating significant influences in the analysis. However, the study found that AI has a positive yet statistically insignificant influence on accounting relevance, with a coefficient of 0.091; a t-statistic of 1.425, and a p-value of 0.154. This suggests that while AI tools are currently used in accounting and are seen as enhancing reporting usefulness, their full potential has yet to be maximized for greater relevance.

Similarly, blockchain technology (BCK) has a direct positive effect on the relevance of accounting information, with a coefficient of 0.130; a t-statistic of 1.865, and a p-value of 0.062. Although there is potential for blockchain to revolutionize accounting practices, the effect observed in this study is not statistically significant, indicating that further efforts are needed to enhance its contribution to accounting information relevance.

On the other hand, cloud computing (CCC) shows a direct, positive, and significant impact on the relevance of accounting information, with a coefficient of 0.272, a t-statistic of 3.37, and a p-value of 0.001. This suggests that adopting cloud computing has notably impacted the cost structure of accounting operations, improved data accessibility, and enhanced collaboration, thus significantly contributing to the relevance of accounting information.

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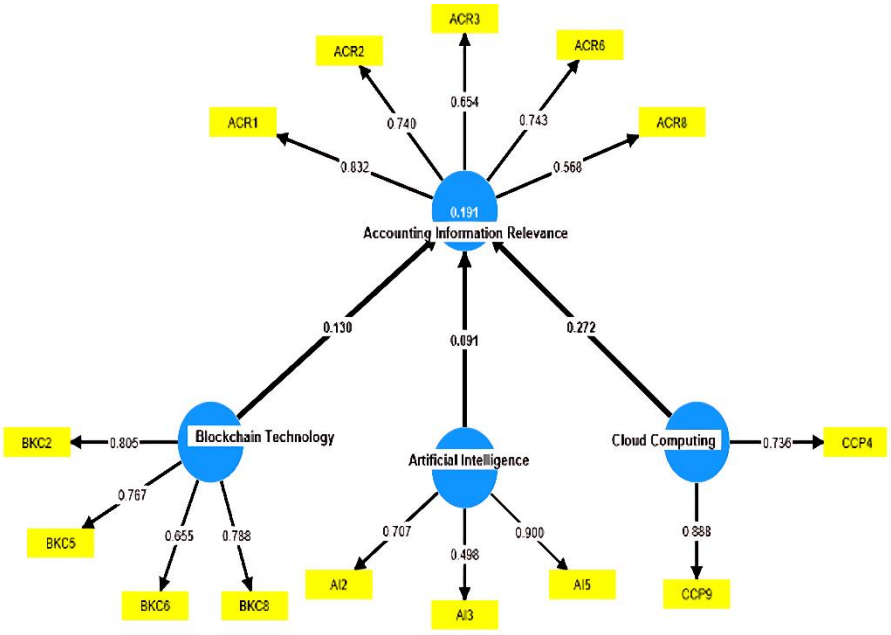

Figure 2.
Partial Least Squares Structural Equation Modelling showing the Effect of Technological Advancement on Accounting Information Relevance.

In conclusion, it is evident that the path coefficients were crucial in determining whether the null hypothesis should be rejected. However, all the constructs had p-values less than 5 percent. Thus, the null hypothesis that technological advancement has no significant effect on accounting information relevance is rejected.

Table 5.
Effect of Technological Advancement on Accounting Information Relevance.

Constructs	Path Co-efficient	T- Statistics	P- Values
Artificial Intelligence -> Accounting Information Relevance	0.091	1.426	0.154
Blockchain Technology -> Accounting Information Relevance	0.130	1.865	0.062
Cloud Computing -> Accounting Information Relevance	0.272	3.337	0.001
	R Square	Adjusted R Square	Q^2
Accounting Information Relevance	0.191	0.189	0.167
	F-Square (Effect Size)	Q^2	Model_ Fit Summary
AI	0.006	0.190	SRMR - 0.118
BCK	0.010	0.042	NFI - 0.508
CCC	0.041	0.033	

5. Conclusions and Recommendations

The study assessed the effect of technological advancement and accounting information relevance among Small and Medium Enterprises (SMEs) in Nigeria, examining the effect of cloud computing, blockchain technology, and artificial intelligence on the relevance of accounting information among SMEs in Nigeria.

The study concludes that effective company management, tasked with driving growth and meeting stakeholders' needs, must ensure that financial information is relevant for making useful economic decisions, focusing on both confirmatory and predictive relevance. The analysis revealed that

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technological advancement, particularly cloud accounting, significantly impacts the relevance of accounting information.

5.1. Policy Implications

The findings of this study suggest that managers should integrate artificial intelligence into their financial operations to enhance efficiency and ensure that the information provided is relevant to end users. Companies should consider adopting blockchain technology to improve the quality of financial reports, stabilize the company, and provide valuable information for economic decision-making. Also, accountants are encouraged to use cloud computing to maximize the relevance of financial information and improve its effectiveness.

Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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